DOCUMENT RESUME

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IDENTIFIERS Adult Competency Education Project; California (San Mateo County); *Motorcycles

ABSTRACT

This fourth of fifteen sets of Adult Competency Education (ACE) Competency Based Job Descriptions in the ACE kit contains job descriptions for Refrigerator Mechanic and Motorcycle Repairperson. Each begins with a fact sheet that includes this information: occupational title, D.O.T. code, ACE number, career ladder, D.O.T. general educational developmental level, site(s) at which job can be observed, job requirements, and job description (D.O.T.). The following pages list twenty to forty competencies (specific math and communicative activities) needed to function successfully in the occupation. Each competency is presented as (1) exact skill found to have been essential to the job during an on-site employee interview, (2) measurable instructional objective defining the skill (performance criterion, not job related), and (3) specific tasks with which to test a student's ability at the skill (the job-related performance criterion). (Instructional objectives match those in the ACE Taxonomy as indicated by a code identifying unit, item, and specific objective.) Skills that are prerequisite to the competencies are noted. (Additional job descriptions, kit manuals, and the project final report are also available in ERIC--see Note.) (YLB)

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Adult Competency Education kit

a project of the career preparation centers

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PART G

ACE COMPETENCY BASED JOB DESCRIPTIONS:

22 - Refrigerator Mechanic
24 - Motorcycle Repairperson

BASIC SKILLS IN SPEAKING, MATH, AND READING FOR EMPLOYMENT

Products and Processes
Developed by the
Adult Competency Education Project
Director, Joe Cooney

CE 016 825

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NOTE

JOB DESCRIPTION NUMBERS. ACE investigated 100 jobs and developed 68 of them into Competency Based Job Descriptions. The above 68 are numbered according to the original listing. The gaps are in the numbering only. This is a complete list of the ACE Competency Based Job Descriptions.

COMPETENCY BASED JOB DESCRIPTION FACT SHEET

OCCUPATIONAL TITLE: REFRIGERATOR MECHANIC & INSTALLER

D.O.T. CODE: 827.381 (4th Ed.: 827.361-014)

A.C.E. Number: 22

CAREER KADDER:

FIRST LEVEL: Refrigerator Mechanic & Installer

SECOND LEVEL: Refrigeration Foreman

THIRD LEVEL: Refrigeration Engineer

D.O.T.'s General Educational Level: 3

SITE WHERE THE JOB CAN BE OBSERVED:

Carney Refrigeration Co.
Commercial & Domestic
1031 North Bayshore
San Mateo, California

The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

Number of Annual Jobs in San Mateo County: 42. This number is based upon the San Francisco-Oakland SMSA, U. S. Census Manpower projections and the quarterly employment security applicant record system reports on local San Mateo County Development Department job opening activity.

Usual Entrance Requirements - Application form, interview with emphasis on experience.

JOB DESCRIPTION (D.O.T.) - Fabricates and assembles components of refrigeration systems for environmental test equipment according to blueprints or schematic drawings and knowledge of refrigeration systems, using handtools and powered tools and welding equipment: Reads blueprints or schematic drawings to determine location, size, capacity, and type of components, such as compressor, condenser, expansion tank, valves, and tubing or piping needed to build refrigeration system. Mounts compressor, condenser, and other components in specified locations on frame, using handtools and arc or acetylene welding equipment. Cuts, bends, and brazes specified tubing to inlets and outlets of components to form liquid and suction lines of refrigeration system, using knowledge of metal properties. Installs expansion and control valves, using acetylene torch and wrenches. Adjusts valves according to specifications. Removes air from system and charges system with specified amount and type of refrigerant (GAS CHARGER). Tests lines, components, and connections for leaks with leak detector which indicates presence of refrigerant (GAS-LEAK TESTER). Attaches thermocouples to various points of refrigeration system and test-operates equipment to evaluate functioning and cooling capacity of system. Records pressure and temperature readings from gauges and temperature potentiometer during test run. Compares reading with specifications to evaluate performance of system, and adjusts or replaces parts as indicated. May fabricate and assemble structural portions of test equipment. May assemble and mount electrical wiring circuits, controls, and recording devices. May fabricate and assemble cascade and multiple-stage refrigeration systems.

THE ACADEMIC REQUIREMENTS FOR THE JOB OF

REFRIGERATOR MECHANIC & INSTALLER

Below are listed first in general terms and then in specific competencies the math and communication activities which a person must typically be able to carry out to function successfully as a Refrigerator Mechanic & Installer.

The right hand column lists the exact competencies found to have been essential to the job in our on-site employee interview. This column also notes the skills which are prerequisite to those competencies.

The center column* states the skill in more general language. The controlled language of this column permits comparison of skills between occupations.

* The items in the center column have been abstracted from an abbreviated version of the taxonomy of generic skills developed by Kawula, W. and Smith, A. De W., Generic Skills Handbook of Occupational Information, Training Research and Development Station, Prince Albert, Saskatchewan, 1975.

1A.1	Prerequisite to 12D.1	Given a series of numbers in numeral form (e.g., 10, 20, 30) be able to copy series in hand-written form with 100% accuracy.
1A.2	Prerequisite to 1A.5	Identify place value of digits in a given whole number with up to 7 digits.
1A.3	Prerequisite to 1A.5	Read a given whole number less than 10 million and write its name in words.
1A.4	Prerequisite to 9A.4	Write a whole number less than 10 million given the word name of the number.
1A.5	The REFRIGERATOR MECHANIC & INSTALLER must be able to determine how many rooms he will need to heat in a building and thus how much material to bring to the job.	
		To accomplish this task, the student must be able to count a set of up to 100 objects and state or write the number of objects counted.
		To demonstrate the ability to perform this task, the student will count the number of chairs in a given room and write the total on a slip of paper.
1B.1	Prerequisite to 3E.3	Perform additions of whole numbers given instructions such as: What is the total of 8 and 5? 8 plus 5 is ___. Find the sum of 8 and 5. Add 8 and 5. 8 + 5 = ___.
1B.2	Prerequisite to 3E.3	Find the sum of a set of whole numbers of 1-5 digits including cases where carrying is required.

1B.3	Prerequisite to 3E.4	Perform subtraction of whole numbers given instructions such as: 8 minus 5 is ___. Subtract 5 from 8. Find the difference of 8 and 5. 8 - 5 = ___. If you had 8 and gave away 5, you would have ___. 8 / -5
1B.4	Prerequisite to 3E.4	Find the difference of two 1-5 digit numbers including cases where borrowing is required.
1B.5	Prerequisite to 5B.9	Solve a routine word problem using subtraction and/or addition of whole numbers.
1C.1	Prerequisite to 4B.1	Perform multiplication of whole numbers given instructions such as: 6 times 2 is ___. 6 x 2 = ___. six two's are ___. 6 / x2 The product of 6 and 2 is ___.
1C.2	Prerequisite to 4B.1	Find the product of a given pair of whole numbers of which one number is up to 5 digits and the other number up to three digits.
1C.3	Prerequisite to 6A.6	Perform division of two simple whole numbers (no remainder) given instructions such as: 6 divided by 2 is ___. 6 ÷ 2 = ___. 2 into 6 goes ___ times. 2)6 = ___. The quotient of 6 divided by 2 is ___. 6/2 = ___.
1C.4	Prerequisite to 6A.6	Find quotients of 1 - 5 digit dividends and 1 - 3 divisors including cases where there are remainders.
1D.1	Prerequisite to 5D.4	Use addition, subtraction, multiplication or division, as appropriate, in the solution of problems involving a combination of two or more functions with whole numbers.

2A.1b The REFRIGERATOR MECHANIC & INSTALLER must be able to order pipe fittings, suction tubes, and other refrigeration supplies.

To accomplish this task, the student must be able to read fractions orally and state their meanings.

To demonstrate the ability to perform this task, the student will examine the fractions below, read them aloud, and then explain to the instructor what each fraction means:
1/2; 3/8; 9/16; 7/32

2A.2 Prerequisite to 6C.4 — Reduce a fraction to its simplest form (lowest terms).

2A.3 Prerequisite to 6C.4 — Change improper fractions to mixed numbers and mixed numbers to improper fractions.

2A.4 Prerequisite to 9A.4 — Write equivalent fractions for a given fraction, given a new numerator and denominator.

2A.5 The REFRIGERATOR MECHANIC & INSTALLER must be able to use the proper drills and piping for installation of machinery.

To accomplish this task, the student must be able to arrange a set of fractions and/or mixed numbers in ascending or descending order.

To demonstrate the ability to perform this task, the student will rank the following fractions from least to greatest and then read them aloud, in order, from the largest to the smallest:
1/2, 13/16, 5/8, 1 1/4, 1 3/8, 1 3/16, 23/32

KEY: 1/2, 5/8, 23/32, 13/16, 1 3/16, 1 1/4, 1 3/8

2B.1 Prerequisite to 2B.4 — Calculate the sum in simplest form of two or three common fractions with like denominators.

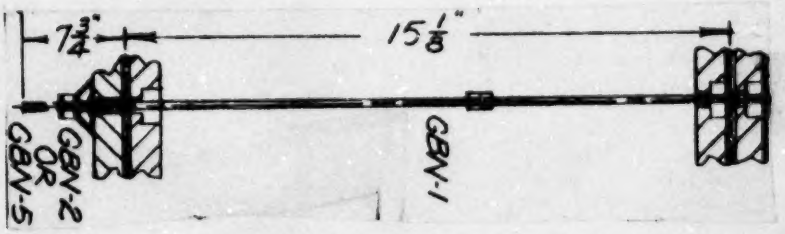
2B.2 Prerequisite to 2B.4 — Calculate the sum in simplest form of two or three common fractions with unlike denominators.

2B.3 Prerequisite to 2B.4 — Calculate the sum in simplest form of two or three mixed numbers with like and unlike denominators.

2B.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to read and understand drawings in order to properly install various appliances and accessories.

To accomplish this task, the student must be able to calculate the sum in simplest form of two or three numbers which include at least one proper fraction and one mixed number.

To demonstrate the ability to perform this task, the student will examine the drawing below and determine the overall length indicated.



KEY: 22 7/8"

2B.5 Prerequisite to 2B.9 — Calculate the difference in simplest form of two common fractions with like denominators.

2B.6 Prerequisite to 2B.9 — Calculate the difference in simplest form of two common fractions with unlike denominators.

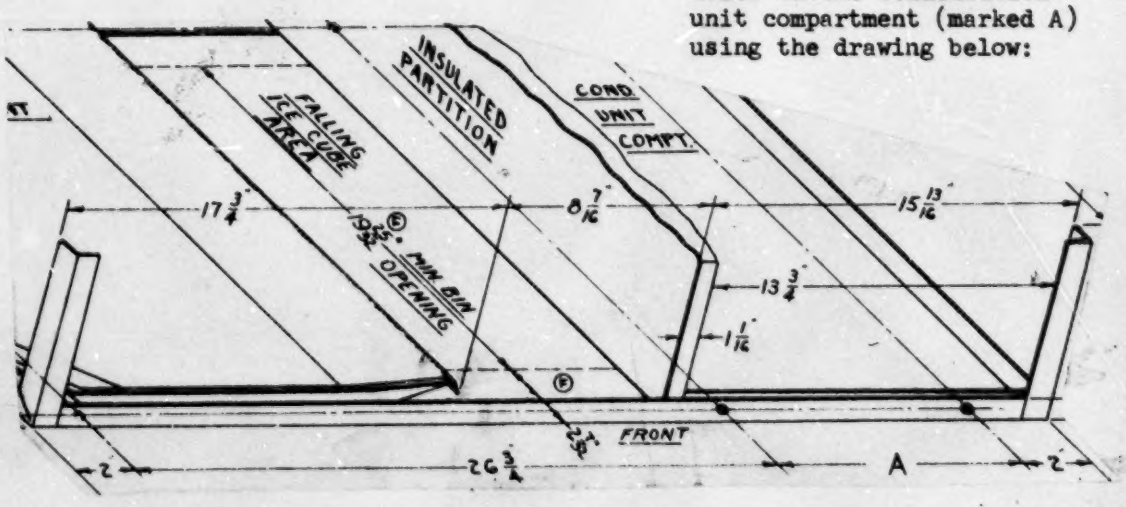
2B.7 Prerequisite to 2B.9 — Calculate the difference in simplest form of two mixed numbers which have <u>like</u> denominators including cases where borrowing is required.

2B.8 Prerequisite to 2B.9 — Calculate the difference in simplest form of two mixed numbers which have <u>unlike</u> denominators including cases where borrowing is required.

2B.9 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine clearances between parts for installation of various refrigeration machinery.

To accomplish this task, the student must be able to solve a routine word problem using addition and/or subtraction of fractional numbers.

To demonstrate the ability to perform this task, the student will determine the total length of the front of the machinery and the distance between the two bolt holes in the condensation unit compartment (marked A) using the drawing below:



KEY: 42"; 11 1/4"

2C.1 Prerequisite to 2C.3

Calculate the product in simplest form of:

a. a common fraction and a whole number,
b. two common fractions.

2C.2 Prerequisite to 2C.3

Calculate the product in simplest form:

a. a mixed number and a whole number,
b. two mixed numbers.

2C.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine the volume in cubic inches of cylinders in a compressor in order to estimate its output.

To accomplish this task, the student must be able to calculate the product in simplest form of two or three numbers which include at least one common fraction and one mixed number and/or a whole number.

To demonstrate the ability to perform this task, the student will multiply 1 1/8" by 1 1/8" (the radius of the cylinder squared) by 22/7 (π) by 1 1/2" (the stroke) by 2 (the number of cylinders) to determine the volume in cubic inches per stroke of a compressor.

ANSWER: 11 209/224 cubic inches.

3A.1 Prerequisite to 3A.3

Read a given 1 - 4 place decimal fraction and write its name in words.

3A.2 The REFRIGERATOR MECHANIC & INSTALLER must be able to take orders over the phone and write down the proper current and power ratings on transformers and motors.

To accomplish this task, the student must be able to write a 1 - 4 place decimal fraction, given the word name of the number.

To demonstrate the ability to perform this task, the student will correctly write the following numbers to be read orally by the instructor:

Seven and one-half;
One hundred fourteen and sixty-three one hundredths;
Two and three one hundredths.

KEY: 7.5; 114.63; 2.03

3A.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to read vapor pressure and refrigerant charts in order to obtain data about various chemicals.

To accomplish this task, the student must be able to arrange a set of decimals in ascending or descending order.

To demonstrate the ability to perform this task, the student will arrange the first set below in ascending order, and the second set of decimals in descending order:

28.4	17.7	37.9	376	11.5	0.51	23.4
23.8	14.6	32.9	346	8.9	2.6	19.8

KEY: 0.51, 11.5, 17.7, 23.4, 28.4, 37.9 376
346, 32.9, 23.8, 19.8, 14.6, 8.9, 2.6

3B.1	Prerequisite to 3E.3	Calculate the sum of a set of decimal fractions.
3B.2	Prerequisite to 3E.4	Calculate the difference of two decimal fractions.
3B.3	Prerequisite to 5D.4	Solve a routine word problem using addition and/or subtraction of decimal fractions.
3C.1	Prerequisite to 3C.6	Calculate the product of two decimal fractions when rounding off is (a) not required, and (b) required.
3C.2	Prerequisite to 4B.1	State or write the product of a number and a power of 10 between .001 and 1,000, without written calculation.
3C.3	Prerequisite to 5A.1	Calculate to a given number of decimal places, the quotient of a whole number divided into: a. a whole number larger than the divisor, b. a whole number smaller than the divisor, c. a decimal fraction.
3C.4	Prerequisite to 5A.1	Calculate to a given number of decimal places, the quotient of a decimal fraction divided into: a. a decimal fraction, b. a whole number.
3C.5	Prerequisite to 5A.1	State or write the quotient of a number divided by a power of 10 between .001 and 1,000, without written calculation.

3C.6 The REFRIGERATOR MECHANIC & INSTALLER must be able to estimate total output of compressors by knowing the speed of the condensing unit and the volume of its cylinder.

To accomplish this task, the student must be able to solve a routine word problem using multiplication and/or division of decimals.

To demonstrate the ability to perform this task, the student will solve the following:

The actual displacement of a compressor is 105 cubic feet/hour. The specific volume is 1.27 cubic feet/pound. How many pounds/hour are produced? Convert the pounds per hour to BTU's per hour by multiplying by a factor of 82.6 (refrigerating effect of 1 pound of R-12).

KEY: 48.85 lb./hr.; 4030 B.T.U./hr.

3E.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to bill independent servicers and customers for parts, work and installation.

To accomplish this task, the student must be able to add columns of dollars and cents values including amounts from $ 01 to $9,999.99.

To demonstrate the ability to perform this task, the student will correctly solve the following problems:

a.) $25.25 + .16

b.) $114.29 + .99 + 6.92

c.) $1,475.89 + 285.50 + 105.68

KEY: a.) $25.41; b.) $122.20; c.) $1,867.07

3E.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to give discounts to wholesalers and independent servicemen.

To accomplish this task, the student must be able to subtract one amount of money from another with values up to $10,000.00.

To demonstrate the ability to perform this task, the student will correctly determine the answers to the problems below:

a.) $9,867.99 − 986.80

b.) $489.67 − 97.94

c.) $21.89 − 1.09

KEY: a.) $8,881.19; b.) $391.73; c.) $20.80

3E.5 Prerequisite to 6H.1 Calculate the total cost of up to 25 items of equal value.

3F.1 Prerequisite to 5D.4 Use addition, subtraction, multiplication or division, as appropriate, in the solution of problems involving a combination of two or more functions with decimal fractions.

4B.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to work with machinery requiring precise tolerances.

To accomplish this task, the student must be able to calculate a percent of a number of the following types:

5% of 170 = ___.
5.7% of 170 = ___.
5.7% of 17.43 = ___.

To demonstrate the ability to perform this task, the student will determine the following percentages:

1.) 15% of 180
2.) 105% of 3000
3.) 1 3/4% of 6.5

KEY: 1.) 27; 2.) 3,150; 3.) .11

4B.2 Prerequisite to 5B.1

Calculate percent problems like determining % one number is of another such as:

a. 12 is ___% of 60?
b. 1.2 is ___% of 60?
c. 12 is ___% of 60.5?

4B.3 Prerequisite to 5B.1

Calculate percent problems like determining a number when a % of it is known such as:

a. 5% of ___ = 60.
b. 5.5% of ___ = 60.
c. 5.5% of ___ = 60.5.

5A.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to use drills and select the proper sized bits.

To accomplish this task, the student must be able to convert:

a. a common fraction or mixed number to a decimal fraction.
b. a decimal fraction to a common fraction or mixed number.

To demonstrate the ability to perform this task, the student will examine the lists below and perform the correct operations:

1.) Change the following into fractions or mixed numbers:
.375; .03125; .3; 8.625.

2.) Change the following into decimal fractions:
1/4; 2 1/5; 5/32; 19/64.

KEY: 1.) 3/8; 1/32; 3/10; 8 5/8;
2.) .25; 2.2; .15625; .296875.

5B.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to figure sales taxes and markups when dealing with invoices.

To accomplish this task, the student must be able to solve a routine word problem involving calculation of a percent of a number.

To demonstrate the ability to perform this task, the student will solve the following problem:

You have bought 500 ft. of 2 in. conduit at $55.00/100 ft. If you sell it at a 35% markup, how much would 300 feet of it sell for? What percent of the cost did you make on the sale? What would be the sales tax (6%) on the sale? What would be the total selling price?

KEY: $222.75; 81%; $13.37; $236.12.

5B.8 Prerequisite to 5B.9

Write a mathematical expression relating the facts in a given problem and then simplify that expression.

5B.9 The REFRIGERATOR MECHANIC & INSTALLER must be able to independently solve problems arising from installations or repairs.

To accomplish this task, the student must be able to, given word problems appropriate to a selected occupation, select arithmetic functions to be performed; the order in which they are to be done; and obtain the required solution.

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To demonstrate the ability to perform this task, the student will solve the problem below:

If 150 cubic feet of water are poured into a rectangular tank whose base measurements are 20 ft. x 10 ft., what is the depth of the water?

ANSWER: 9 in. or 3/4 foot.

5C.1 Prerequisite to 5C.3

Identify comparisons of two numbers in forms such as a:b, "a is to b," or "a parts to b parts," as ratios.

5C.2 Prerequisite to 5C.3

State or write in simplest form (lowest terms) a ratio of two numbers or items in the form:

a. a:b,
b. $\frac{a}{b}$

5C.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to work with drive belts for fans and machinery involving gears.

To accomplish this task, the student must be able to write a ratio given a description of two numbers or items, one of which must be determined by addition or subtraction of the numbers in a given ratio.

To demonstrate the ability to perform this task, the student will determine that if he has two gears, one with 48 teeth and one with 16, and he replaces the smaller gear with one having 4 less teeth, the old ratio was 3:1 and the new one is _____.

ANSWER: 4:1.

5D.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to communicate with possible customers as to the efficiency of various equipment to develop selling points or as an informational service.

To accomplish this task, the student must be able to solve a routine word problem which involves a ratio, using the proportion required.

To demonstrate the ability to perform this task, the student will solve the following:

An industrial plant runs three compressors continuously. The motors operating the compressors have horsepowers in the ratio of 3:5:7. If the total operating cost is $570/month, find the cost per month of each compressor.

ANSWER: $114; $190; $266.

6A.2 Prerequisite to 6A.6 Calculate the area of a given square.

6A.3 Prerequisite to 6A.6 Calculate the area of a given rectangle.

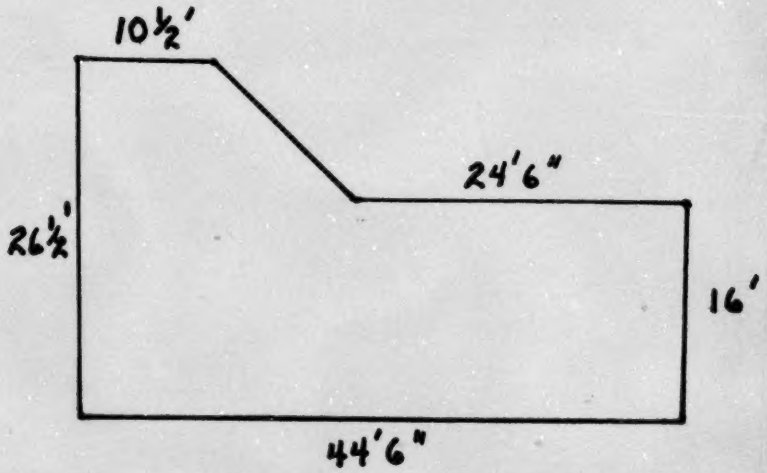
6A.4 Prerequisite to 6A.6 Calculate the area of a given triangle.

6A.5 Prerequisite to 6A.6 Calculate the area of a given circle.

6A.6 The REFRIGERATOR MECHANIC & INSTALLER must be able to figure out the areas of the ceiling and floor of a room in order to determine the cooling load.

To accomplish this task, the student must be able to solve a practical problem involving area calculations of a square, rectangle, triangle, and/or circle.

To demonstrate the ability to perform this task, the student will find the area of the figure below:



ANSWER: 125,586 sq. in. or 872 1/8 sq. ft.

6B.1 Prerequisite to 6B.5 — Identify perimeter as the length of the outer boundary of a plane figure and identify the units used as inches, feet, yards, etc.

6B.2 Prerequisite to 6B.5 — Calculate the perimeter of a given rectangle or square.

6B.3 Prerequisite to 6B.4 — Identify π as a constant equal to c/d for all circles and identify its approximate value as 3 1/7 or 3.14.

6B.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to form gaskets from gasket material when none are readily available.

To accomplish this task, the student must be able to calculate the circumference of a circle given:

a.) its radius
b.) its diameter

To demonstrate the ability to perform this task, the student will correctly determine the circumferences of circles with:

a.) a 4" diameter
b.) a 16 mm radius

KEY: a.) 12.56"; b.) 100.48 mm.

6B.5 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine the cooling load of a room by taking into account the lineal feet of walls.

To accomplish this task, the student must be able to solve a routine word problem involving perimeter.

To demonstrate the ability to perform this task, the student will correctly solve the following problem:

A job requires that you determine the lineal feet of wall in a rectangular room measuring 17' 10" by 33' 3". How many feet of wall are in the room?

ANSWER: 102' 2".

6C.1 Prerequisite to 6C.4 Calculate the volume of a given rectangular solid (including cubes).

6C.2 Prerequisite to 6C.4 Calculate the volume of a given cylinder.

6C.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine whether existing heating ducts have a large enough capacity to be used for cooling or if additional ducts must be built.

To accomplish this task, the student must be able to solve practical problems involving volume calculations of rectangular solids and cylinders.

To demonstrate the ability to perform this task, the student will solve the two problems below:

1.) How many cubic centimeters are there in a rectangular box 0.75 m long, 30 cm wide, and 20 cm high?

2.) What is the volume of a cylinder with a diameter of 12 inches and a height of 7 feet?

KEY: 1.) 45,000 cc; 2.) 9,504 cu. in. $\left(\frac{22}{7}\right)$ or 9,495 cu. in. (3.14).

6F.2 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine the amount of materials needed for a job.

To accomplish this task, the student must be able to measure a given distance or one dimension of an object with a ruler or tape measure correct within one unit of the scale.

To demonstrate the ability to perform this task, the student will correctly measure the dimensions of the room which he and the instructor occupy.

6F.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to carry machinery and tools through doorways and narrow spaces.

To accomplish this task, the student must be able to estimate the length, width, height, or distance between objects, within 20% of actual measurement, in cases such as the following:

a. dimensions of a book, box, desk, room or building
b. distances up to 200 yards

To demonstrate the ability to perform this task, the student will correctly estimate the size of such objects as table tops, doorways or the distance between 2 objects such as a bookcase and a filing cabinet, etc., as designated by the instructor.

6G.5 Prerequisite to 6H.1

Multiply given units to time intervals (e.g., 3 people times 4 hours and 35 minutes).

6G.6 Prerequisite to 6H.1

Given unit costs for material, wage or salary rates for labor and the total items, and hours/days of work, calculate total costs.

6H.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to provide estimates for prospective customers and bill customers for work done.

To accomplish this task, the student must be able to calculate total costs, given unit costs for material, wage or salary rates for labor and the total items, and hours/days of work.

To demonstrate the ability to perform this task, the student will correctly determine the total cost of a job given the following information:

1 foreman (at $16/hour) and 2 workers (at $9/hour) worked 14 hours each to install a compressor ($600) and 400 feet of duct (at $2.50 per foot).

ANSWER: $2,076.

8A.3 Prerequisite to 8A.5

Identify a series of consecutive whole numbers or multiples of whole numbers with or without equal subdivisions between numbers on a measuring device, as a graduated scale.

8A.4 Prerequisite to 8A.5

Write the size of the interval between:

a. numerals on a graduated scale.
b. subdivisions on a graduated scale

8A.5 The REFRIGERATOR MECHANIC & INSTALLER must be able to read a variety of gauges and scales.

To accomplish this task, the student must be able to write the measurement indicated on a sketch of a graduated scale:

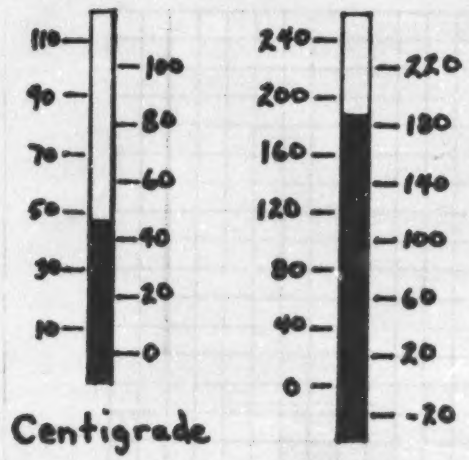
a. to the nearest whole number when the scale is marked off in consecutive whole numbers with or without subdivisions.

b. to a given precision when the scale is marked off in multiples of a whole number with or without subdivisions.

c. to a given precision when the scale is marked off in whole numbers with or without subdivisions representing fractions such as halves, quarters, eighths, sixteenths, tenths, or fifths.

d. to a given precision when the scale is marked off in whole numbers which represent multiples of a given number such as 100 or 1000.

To demonstrate the ability to perform this task, the student will correctly read the two thermometers below within 2°:

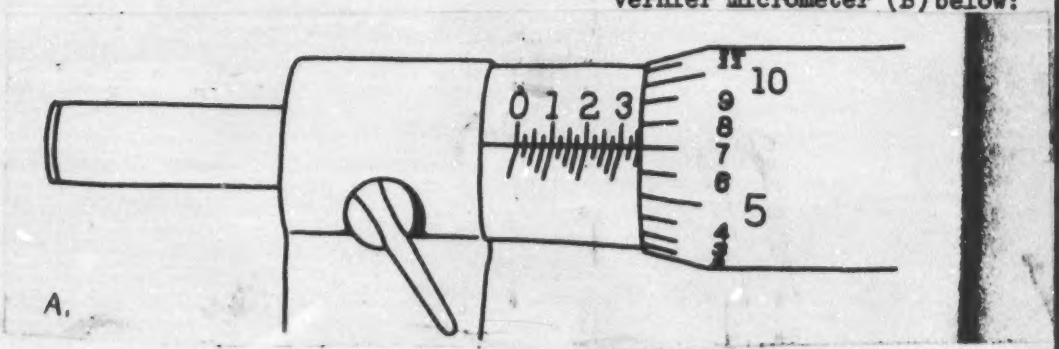


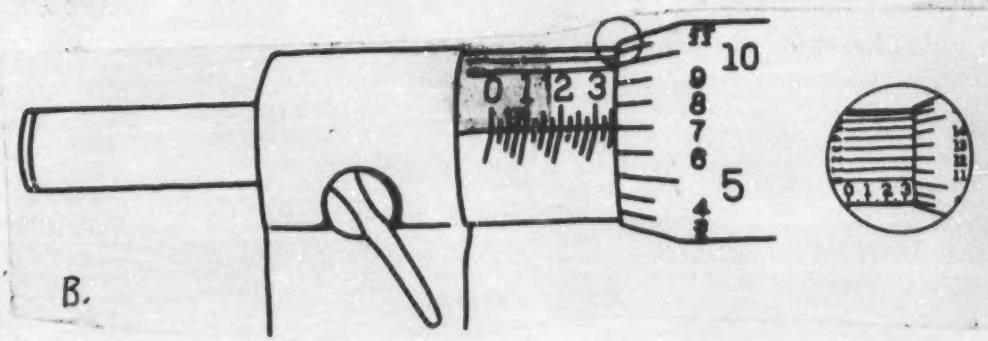
KEY: 47°C; 187°F.

8A.7 **The REFRIGERATOR MECHANIC & INSTALLER must be able to measure tiny distances and tolerances of parts.**

To accomplish this task, the student must be able to write the measurement indicated on a sketch of interlocking scales, such as on micrometers and vernier calipers.

To demonstrate the ability to perform this task, the student will correctly write down the measurements indicated on the conventional micrometer (A) and the vernier micrometer (B) below:





KEY: A. .357"; B. .3572".

9A.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to install various machinery into already existing buildings.

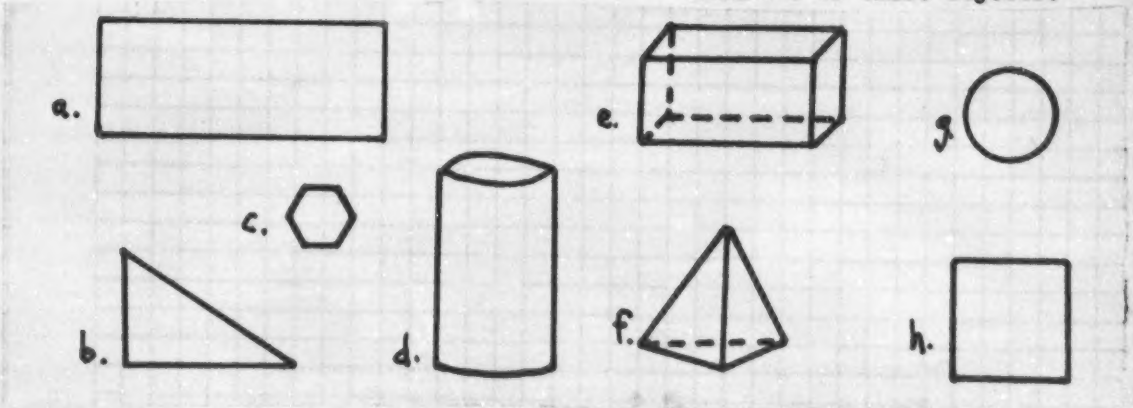
To accomplish this task, the student must be able to measure a given distance or one-dimensional object with a ruler or tape measure, correct within one unit of the scale reading.

To demonstrate the ability to perform this task, the student will accurately measure the width, height and depth of a door or window in the room.

11A.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to perform assembly work.

To accomplish this task, the student must be able to identify rectangles, squares, triangles, circles, rectangular solids, cubes, pyramids, cones, cylinders and spheres from a set of objects, pictures of objects or names of objects.

To demonstrate the ability to perform this task, the student will orally name each of the objects pictured below and point out objects in the room representing at least 6 of these objects.

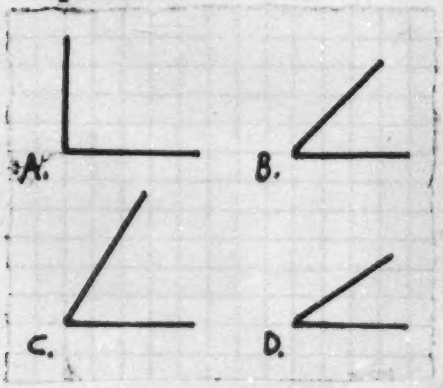


KEY: a. rectangle; b. triangle; c. hexagon; d. cylinder; e. rectangular solid; f. pyramid; g. circle; h. square.

11B.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to roughly sketch building plans for installation and must also be able to recognize various pipe fittings.

To accomplish this task, the student must be able to identify 30°, 45°, 60° and 90° angles from a set of such angles, without the aid of a protractor.

To demonstrate the ability to perform this task, the student will correctly identify each of the angles depicted below:



KEY: A. 90°; B. 45°; C. 60°; D. 30°.

11C.1	Prerequisite to 12C.1	Draw or sketch (not to scale) (student choice) squares, rectangles, triangles, circles, cubes, rectangular solids, cylinders, cones and pyramids.
11C.2	Prerequisite to 12C.1	Represent, by drawing or sketching (student choice), common objects using oblique projections.
12A.1	Prerequisite to 12C.1	Identify 1:4, 6:1, 1" to the foot, 1" = 5 mi., 1:50,000, etc., as examples of scales used to represent reductions or expansions of the actual size of an object.
12A.2	Prerequisite to 12C.1	Convert a scale measurement to true size given the scale.
12B.1	Prerequisite to 12B.2	Draw a line to a given scale.

12B.2 The REFRIGERATOR MECHANIC & INSTALLER must be able to order new parts from broken parts.

To accomplish this task, the student must be able to draw a plane figure to represent a given flat object to a given scale.

To demonstrate the ability to perform this task, the student will draw a picture of a table top to the scale of 1/2" = 1'.

12C.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to use blueprints and other scale drawings to lay out installations.

To accomplish this task, the student must be able to calculate actual dimensions of an object given a ruler and a simple scale drawing of the object.

To demonstrate the ability to perform this task, the student will examine exhibit 22B and determine the following dimensions:

1.) A to B;
2.) C to D;
3.) C to E;
4.) F to G.

KEY: 1.) 8 1/2"; 2.) 6 2/3"; 3.) 11 1/3"; 4.) 2 1/4".

12D.1 The REFRIGERATOR MECHANIC & INSTALLER Must be able to put together machinery which has been dismantled for shipping or during repairs.

To accomplish this task, the student must be able to identify the order in which parts are put together in an assembly drawing.

To demonstrate the ability to perform this task, the student will examine 22A and explain the order in which you would assemble the parts shown.

12E.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to work on electrical test equipment and electrical refrigeration systems.

To accomplish this task, the student must be able to trace a particular sub-system on a simple schematic drawing.

To demonstrate the ability to perform this task, the student will examine 22C ' and answer the following questions:

1.) What does HA stand for?
2.) What parts does the circuit pass through from the pilot safety switch to the time delay relay?
3.) What is the value of the fuse?

KEY: 1.) Heating anticipator; 2.) Limit thermostat and gas valve; 3.) 2.0 amperes.

13A.1 Prerequisite to 15A.2

Given letters of the alphabet in manuscript form and in random order, read each letter and pronounce each letter correctly.

15A.1 Prerequisite to 15A.2

Read a list of 50 words from a series of commonly used terms (e.g., from the Dolch List).

15A.2 **The REFRIGERATOR MECHANIC & INSTALLER must be able to use a variety of products in his work.**

To accomplish this task, the student must be able to read words from the labels of frequently used products or of products used in a given occupation.

To demonstrate the ability to perform this task, the student will read the label below and explain the following words to the instructor:

insulation	frame
cuber	bin
lag bolts	advisable

If a Uniflow bin is to be used under the Ice Cuber, place one 24" strip of pressure sensitive insulation at each end of the top of the bin, approximately ½" from the edge keeping the ends of the insulation even with the front and back of the bin. Next, place one 40" strip of pressure sensitive insulation on the back of the bin approximately ½" from the edge keeping the ends inside the end insulation.

If preferred, the insulation could be placed on the bottom of the cuber at the ends and back, keeping the insulation at the inside edge of the frame.

On a Uniflow 1000 lb. bin, or another brand of bin, the latter method would be advisable.

Place the cuber on the bin and place the bottom angle cover between the cuber frame and the bin at the front of the cuber. Since there is insulation on the bottom angle cover, the space between the cuber now will be insulated on all four sides.

Place a washer on each of the four lag bolts and fasten the cuber frame to the bin using one lag bolt in each corner. You will see that there are holes through the frame provided for each lag bolt.

15A.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to converse with fellow workers, supervisors and customers.

To accomplish this task, the student must be able to read and use in an oral sentence words from a list of words common to the vocabulary of a given occupation.

To demonstrate the ability to perform this task, the student will correctly match the following words and their definitions:

A.	gauge	1.	nest of tubes for cooling water flowing through them.
B.	schematic	2.	instrument for measuring the temperature of a substance, body or space.
C.	compressor	3.	ring, disk or plate of packing to make a joint water tight.
D.	power rating	4.	instrument for measuring, indicating or regulating the capacity, quantity, dimensions or power of something.
E.	B. T. U.	5.	tube or passage through which air or gas is passed.
F.	blower	6.	power-driven machine for compressing a gas in order to utilize its expansion.
G.	radiator	7.	device for forcing a draft of air through machinery or a building
H.	filter	8.	device for filtering out dust, pollen and other impurities from the air.
I.	microammeter	9.	quantity of heat required to raise the temperature of 1 pound of water 1° Fahrenheit.
J.	duct	10.	instrument like a pair of compasses, usually with curved legs, for measuring diameters.
K.	thermometer	11.	representation of an electrical circuit using standardized symbols.
L.	caliper	12.	maximum wattage whose heat a resistor can dissipate.
M.	gasket	13.	device for measuring tiny amounts of direct current.

KEY: A-4, B-11, C-6, D-12, E-9, F-7, G-1, H-8, I-13, J-5, K-2, L-10, M-3.

15B.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to work safely and efficiently.

To accomplish this task, the student must be able to read aloud and explain a series of common functional signs (e.g., safety signs, road signs, etc.).

To demonstrate the ability to perform this task, the student will read the signs below and briefly explain their meaning to the instructor.

16A.1 Prerequisite to 16A.4 — Identify a form as a standardized printed document with blank spaces for recording certain needed information.

16A.2 Prerequisite to 16A.4 — Interpret terminology and abbreviations frequently found in forms.

16A.3 Prerequisite to 16A.4 — Identify various kinds of forms by stating the kind of information to be recorded.

16A.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to determine cooling loads and other important factors for his work.

To accomplish this task, the student must be able to answer factual questions based on the data contained in common business or reference forms.

To demonstrate the ability to perform this task, the student will examine the form below and answer the following questions:

1.) How many windows are facing northward?
2.) What is the area of the floor?
3.) What does the word "arch" mean?
4.) What are lineal feet?

COOLING LOAD ESTIMATE FORM FOR ROOM AIR-CONDITIONERS

Recommended Practice for Members of Room Air-Conditioner Section of Air-Conditioning and Refrigeration Institute. This estimate is suitable for comfort air-conditioning jobs but requiring specific conditions of temperature and humidity.

Customer ..... Buyer .....

Address ..... Space to be used for .....

Estimate by ..... Date ..... Approval ..... Date .....

ITEM	Quantity	Factor		Cooling Units
		Inside Shades	Outside Awnings	
1. WINDOWS EXPOSED TO SUN, FACING*				
a. East, Southeast, or South	15 sq ft	45	25	
b. Southwest	15 sq ft	65	40	975
c. West	sq ft	100	60	
d. Northwest	sq ft	85	45	
*Use only the exposure with the largest load.				
2. WINDOWS FACING NORTH OR IN SHADE (Include all windows not included in Item 1.)	0 sq ft	14		
3. WALLS (based on lineal feet of wall)				
a. Light construction, exposed to sun*	10 ft	90		900
b. Heavy construction, exposed to sun*	ft	50		
c. Shaded walls or partitions (Include all walls not included in 3a or 3b.)	30 ft	30		900
*Use for only that exposure used in Item 1.				
4. ROOF OR CEILING (Use one only.)				
a. Roof, uninsulated	sq ft	16		
b. Roof, with one inch or more insulation	200 sq ft	7		1400
c. Ceiling, with occupied space above	sq ft	8		
d. Ceiling, with attic space above	sq ft	10		
5. FLOOR (Neglect floor directly on ground or over unheated basement.)	200 sq ft	3		600
6. PEOPLE AND VENTILATION—Number of people	3	900		2700
7. LIGHTS AND ELECTRICAL EQUIPMENT IN USE	300 watts	3		900
8. DOORS AND ARCHES CONTINUOUSLY OPEN TO UNCONDITIONED SPACE (lineal feet of width)	0 ft	300		
9. TOTAL LOAD in cooling units to be used for selection of room air conditioner (s)	XXXX	XXXX		8375

KEY: 1.) None; 2.) 200 sq. ft.; 3.) a curved doorway; 4.) in a straight line - opposed to areas.

16B.1 Prerequisite to 16B.3

Describe the uses of charts and tables and define them as a visual way to give information in a compact and organized form.

16B.2 Prerequisite to 16B.3

State the type of information recorded on given charts or tables.

16B.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to work on machinery which is unfamiliar to him.

To accomplish this task, the student must be able to answer factual questions based on the data supplied by common reference tables and charts.

To demonstrate the ability to perform this task, the student will examine 22D and determine:

1.) the critical temperature of methyl chloride;
2.) which of the refrigerants are toxic;
3.) which refrigerant has the highest coefficient of performance;
4.) whether refrigerant 12 has a higher or lower horsepower/ton refrigeration ratio than Carrene #7.

KEY: 1.) 289.4°F; 2.) All but water and carbon dioxide; 3.) methyl chloride; 4.) lower.

16D.1 Prerequisite to 16D.5

Identify a manual as a handbook of instructions and/or information related to one topic, and give an example of a manual.

16D.2 Prerequisite to 16D.5

Identify the particular kind of information or directions included in a given manual, using the title, table of contents and/or index as guide.

16D.3 Prerequisite to 16D.5

Identify the parts of a given manual which apply to a given situation using the table of contents and/or index as guide.

16D.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to order parts needed for a job.

To accomplish this task, the student must be able to locate a particular part and answer factual questions about its description (e.g., price, code number, vendor, etc.) from a given parts manual.

To demonstrate the ability to perform this task, the student will examine exhibit 22E1, and correctly answer the following:

1.) On what page would flared tube fittings be found?
2.) Where would you look to find Vacuum Grease?

Now examine 22E2 and determine the missing information for each of the following:

1.) part #T1-3A;
2.) female elbow with o.d. of 5/8" and pipe threads of 3/4";
3.) reducing union for 3/4" into 5/8".

16D.5 The REFRIGERATOR MECHANIC & INSTALLER must be able to troubleshoot machinery he is not familiar with.

In general, there are two types of tubing: rigid (hard) and semirigid (soft). The rigid tubing may be hard-drawn copper, stainless steel, or other similar materials. Semirigid tubing may be soft copper, aluminum, brass, or a special alloy. To select the right type of tubing for a job, the following factors must be considered: the kind of refrigeration system, the availability and cost of the different types of tubing, and the kind of fittings to be used.

A knowledge of the refrigerant in the system is important because this refrigerant may have a corrosive effect on copper tubing. Ammonia, for example, corrodes copper; therefore, steel or aluminum tubing must be used with this refrigerant. Refrigeration tubing differs from other types of tubing in that it is cleaned and dehydrated, and the ends are sealed for protection against dirt and moisture.

To accomplish this task, the student must be able to apply instructions or information from a given manual to a particular situation given an oral description of a problem that can be solved using information from the manual.

To demonstrate the ability to perform this task, the student will read the passage to the left and determine which types of tubing should be used with ammonia.

ANSWER: Steel or Aluminum.

17A.1 Prerequisite to 17A.3 — Identify orally the main idea in a given paragraph.

17A.3 The REFRIGERATOR MECHANIC & INSTALLER must be able to understand manuals and other job-related literature.

To accomplish this task, the student must be able to identify orally the main idea in a given paragraph.

To demonstrate the ability to perform this task, the student will read the following paragraph and state the main idea:

Swaging is the process of shaping copper tubing so that two pieces may be joined without the use of a fitting. Either a punch-type or a screw-type swaging tool may be used to form the tubing. When the punch-type tool is used, the tubing is clamped into the flaring bar portion of the tool. The shaped punch of the tool is then hammered into the tubing and swages or expands the end of the tubing so that it will fit over the end of another piece of tubing.

19A.4 Prerequisite to 22E.4 — Identify the main idea from a given speech which has just one main idea.

19A.11 Prerequisite to 22E.4 — List facts from an oral statement which support the main idea.

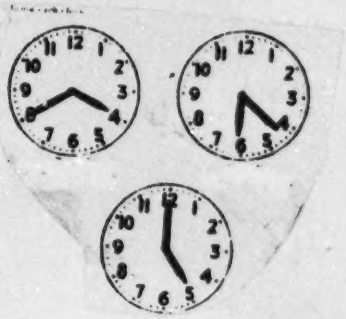
21A.3 Prerequisite to 22E.4 — Given a date (day, month, date, year) write the date using correct punctuation and capitalization.

21A.4 Prerequisite to 21A.5 — Given a standard clock, tell correct time to within 5 minutes of actual time.

21A.5 The REFRIGERATOR MECHANIC & INSTALLER must be able to fill out job orders.

To accomplish this task, the student must be able to write time, given times of the day.

To demonstrate the ability to perform this task, the student will examine the clocks below and write the times indicated:



22A.1 Prerequisite to 22B.2

Given simple data in the form of words and figures, write phrases on forms which are legible and which convey the desired information.

22B.1 Prerequisite to 22B.2

Given simple data in the form of words and figures, write complete sentences on forms which are legible and which convey the required information.

22B.2 The REFRIGERATOR MECHANIC & INSTALLER must be able to apply for a job.

To accomplish this task, the student must be able to complete a sample application form for employment in a legible manner.

To demonstrate the ability to perform this task, the student will accurately fill out exhibit 22F.

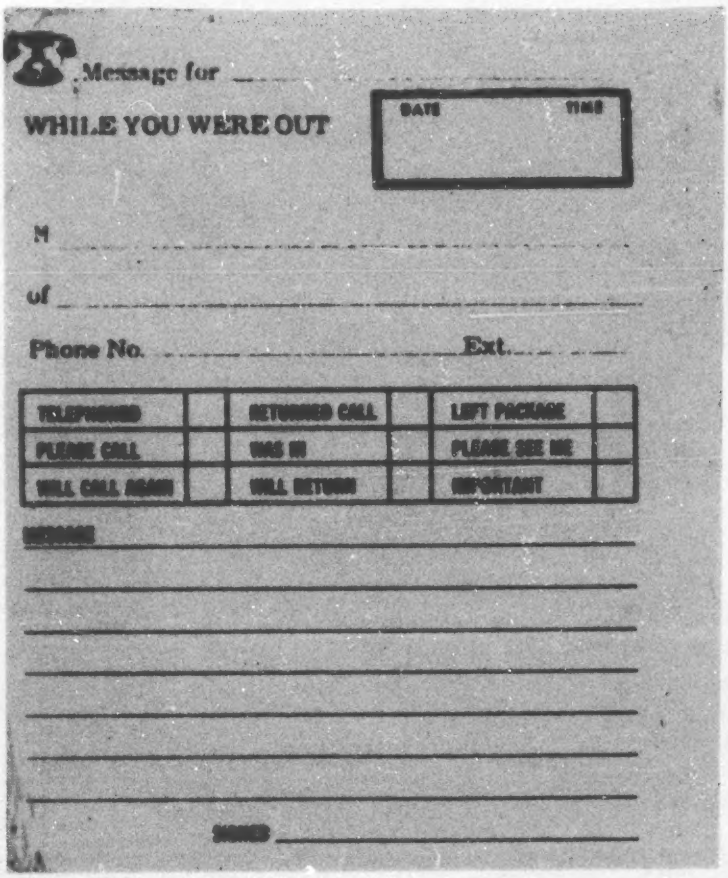
22E.1 Prerequisite to 22E.4 — Write down the exact words of a short message given orally.

22E.2 Prerequisite to 22E.4 — Write the main ideas of a speaker.

22E.3 Prerequisite to 22E.4 — Write notes on details or facts given by a speaker.

22E.4 The REFRIGERATOR MECHANIC & INSTALLER must be able to take messages from independent servicers about parts and equipment.

To accomplish this task, the student must be able to record oral information given by filling out an order form or other standard informational sheets.


Message for _____

WHILE YOU WERE OUT

DATE TIME

M _____

of _____

Phone No. _____ Ext. _____

TELEPHONED		RETURNED CALL		LEFT PACKAGE	
PLEASE CALL		WAS IN		PLEASE SEE ME	
WILL CALL AGAIN		WILL RETURN		IMPORTANT	

MESSAGE _____

SIGNED _____

To demonstrate the ability to perform this task, the student will listen to the following (to be read orally) and record the main points on the memorandum form to the left:

Hi, this is Al Huxley from Chrome Yellow. Will you please tell Robert Owen that we need 2 Sunline SA121 air conditioners by next Tuesday, the 28th. Thank you very much.

26B.1 The REFRIGERATOR MECHANIC & INSTALLER must be able to keep his work place neat and orderly.

To accomplish this task, the student must be able to sort objects by given classification criteria. The sorting should require a minimum of judgment. To oversimplify, sorting apples by types or tools by various generic classifications would be appropriate but sorting apples by quality or lumber by grades is a rating skill.

To demonstrate the ability to perform this task, the student will take a group of common office or classroom items and sort them by their geometric shapes.

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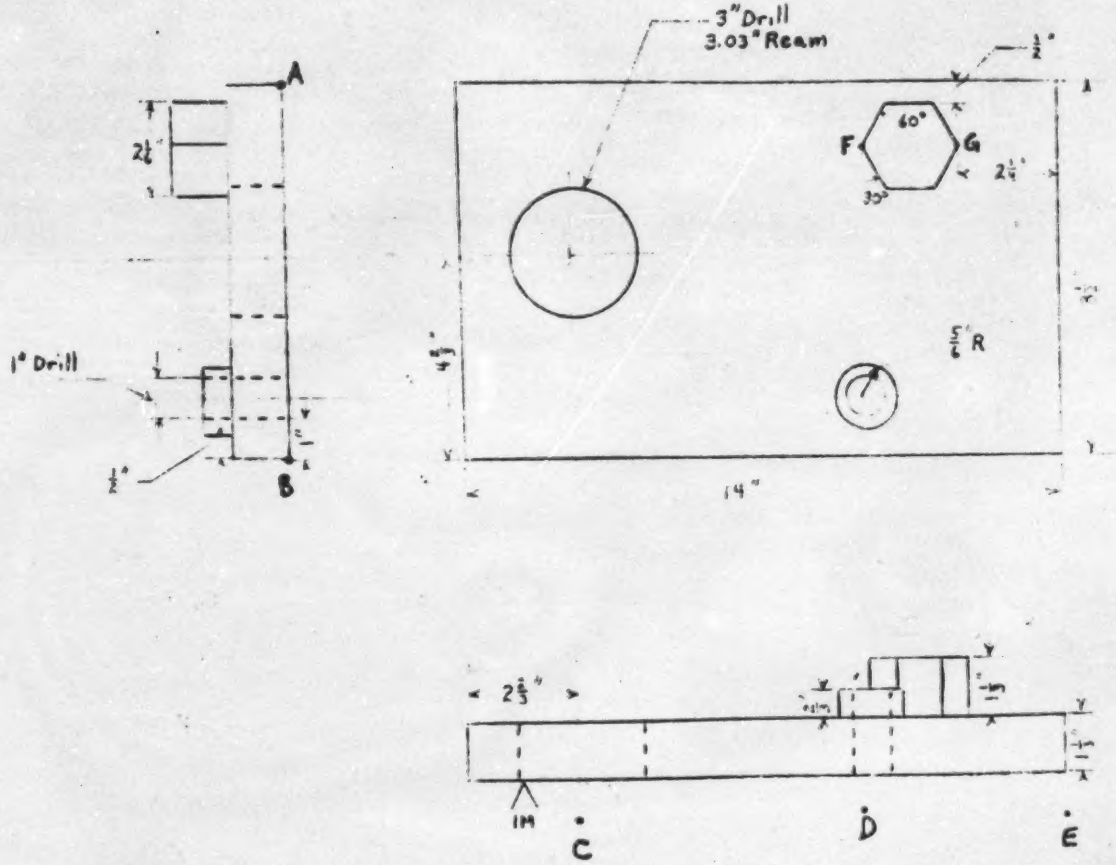
22-A

Substitute Assembly Diagram

ALTERATIONS	DATE
A	
B	

ALLOWABLE VARIATION ON FRACTIONAL DIMENSIONS

± 0.010



DRAWN: Robert Bunsen	PART NAME: Phlogistor	MATERIAL: IRON	SCALE: 1/4" = 1"	HEAT TRTMT: #1
CHECKED: Bill Elford	UNIT: Carbonator	NO. REQ'D: 16	REPLACES:	
APPROVED: Carl Scheele	ENGINEERING DEPT. COOL DAY CO, INC. SHADY GROVE, QUEBEC	PART NO.: 106-A-1764-2P		
DATE: 11-29-76				

22-B

553

14

15

22-C

Substitute Schematic Drawing and Key

22-D

Substitute Table from Manual

22-E 2

Substitute an Illustrated Page from Catalog

22-F

EMPLOYMENT APPLICATION

1. NAME (Last) (First) (Middle)

2. ADDRESS (Number, Street, City, Zip Code) | 3. TELEPHONES Home ____ Business ____

Length of Time at Current Address | Time at Previous Address

QUESTIONS 4 THROUGH 10 MUST BE ANSWERED *YES* OR *NO*

	YES	NO
4. Do you have a valid California Drivers License?		
5. Do you claim Veteran's Preference? If Yes, complete the following and submit copy of DD214 with application. (Veteran's Preference is applicable to entry level positions only.) SERVICE DATES From ____ To ____ NOTE: To receive credit you must have served at least 30 days in the United States Armed Forces in time of war, or national emergency declared by the President of the United States of America, and have been discharged or released under conditions other than dishonorable.		
6. May we contact your present employer as to your qualifications, character and ability?		
7. Have you ever been dismissed from employment or resigned to avoid dismissal for misconduct or unsatisfactory service? (If Yes, give details in Question 11)		
8. Have you ever received Workman's Compensation? (If Yes, describe in Question 11)		
9. Have you any disease, nervous disorder, physical disability or infirmity? (If Yes, describe in Question 11)		
10. Have you been hospitalized for any reason in the past five years? (If Yes, describe in Question 11)		

11 Explanations to questions 7 through 10 (Use additional sheets of paper, if necessary.)

12 **EDUCATIONAL RECORD**

Circle Highest Grade Completed 8 7 8 9 10 11 12 | Name and Location of Last Elementary or High School | Graduated? Yes ☐ No ☐

Name and Location of College or University | Major | Credits or Degree

List any related business, trade, special training (give location and dates); estimated typing and shorthand speeds; San Mateo County typing and/or shorthand certificates (give certificate number and date); location of college placement file, and other related information as applicable.

13. **EMPLOYMENT INFORMATION** (Begin with your present employment and work back. Account for all time during the past ten years, including periods of unemployment. In addition, please describe any other related work experience, including volunteer work. Use additional sheets if more space is required.)

Present or Last Position

Employer ____ From ____ mo. ____ year

Address ____ To ____ mo. ____ year

Supervisor's Name & Title ____ Phone ____ Total ____ years ____ months

Your Title ____ Full Time ☐ Part Time ☐

Duties ____ Last Salary ____

Reason for leaving ____

Employer ____ From ____ mo. ____ year

Address ____ To ____ mo. ____ year

Supervisor's Name & Title ____ Phone ____ Total ____ years ____ months

Your Title ____ Full Time ☐ Part Time ☐

Duties ____ Last Salary ____

14. **PERSONAL REFERENCES - GIVE THREE** (Do not include previous employers or relatives.)

NAME	ADDRESS	PHONE NUMBER

A.C.E. COMPETENCY BASED JOB DESCRIPTION 24

OCCUPATIONAL TITLE: MOTORCYCLE REPAIRPERSON

COMPETENCY BASED JOB DESCRIPTION FACT SHEET

OCCUPATIONAL TITLE: MOTORCYCLE REPAIRPERSON

D.O.T. CODE: 620.281 (4th Ed.: 620.281-054)

A.C.E. NUMBER: 24

CAREER LADDER:

FIRST LEVEL: Motorcycle Repairperson

SECOND LEVEL: Motorcycle Repair Foreman

THIRD LEVEL: Shop Owner

D.O.T.'s GENERAL EDUCATIONAL DEVELOPMENT LEVEL: 3

SITE WHERE THE JOB CAN BE OBSERVED:

Honda of San Mateo
101 E. 25th and Palen Streets
San Mateo, CA

The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

The Adult Competency Education Project
SAN MATEO COUNTY OFFICE OF EDUCATION
609 Price Ave., Redwood City, CA 94063
364-5600 Ext.

Number of annual jobs in San Mateo County: 17. This number is based upon the San Francisco-Oakland SMSA, U.S. Census Manpower projections and the quarterly employment security application record system reports on local San Mateo County Employment Development Department job opening activity.

Usual Entrance Requirements: Job application, interview.

JOB DESCRIPTION (DOT): Repairs and overhauls motorcycles, motor scooters, and similar motor vehicles. Listens to engine, examines vehicle's frame, and confers with customer to determine nature and possible extent of malfunction or damage. Connects test panel to engine and measures generator output, ignition timing, and other engine performance indicators. Dismantles engine and repairs or replaces defective parts, such as magneto, carburetor and generator. Removes cylinder heads, grinds valves and scrapes off carbon, using hand-tools and power tools, and replaces defective valves, pistons, cylinders, and rings. Hammers out dents and bends in frame, welds tears and breaks, and reassembles and reinstalls engine. Repairs and adjusts clutch, brakes, and drive chain. Repairs or replaces other motorcycle and motor scooter parts, such as spring fork, headlight, horn, handlebar controls, valve release, gear lever, gasoline and oil tanks, starter, brake lever, and muffler. May specialize in repair of motor scooters and be designated as MOTOR-SCOOTER REPAIRPERSON.

THE ACADEMIC REQUIREMENTS FOR THE JOB OF

MOTORCYCLE REPAIRPERSON

Below are listed first in general terms and then in specific competencies the math and communication activities which a person must typically be able to carry out to function successfully as a motorcycle repairperson

The right-hand column lists the exact competencies found to have been essential to the job in our on-site employee interview. This column also notes the skills which are prerequisites to those competencies.

The middle column *states the skill in more general language. The controlled language of this column permits comparison of skill between occupations.

*The items in the middle column have been abstracted from an abbreviated version of the taxonomy of generic skills developed by Kawula, W.; and Smith, A. De W.; Generic Skills Handbook of Occupational Information, Training Research and Development Station, Prince Albert, Saskatchewan, 1975.

1A.1 Prerequisite to 1A.5 Given a series of numbers in numeral form (e.g., 10, 20, 30), be able to copy series in handwritten form with 100% accuracy.

1A.2 Prerequisite to 1A.5 Identify place value of digits in a given whole number with up to seven digits.

1A.3 Prerequisite to 1A.5 Read a given whole number less than ten million and write its name in words.

1A.4 Prerequisite to 3E.3 Write a whole number less than ten million given the word name of the number.

1A.5 A MOTORCYCLE REPAIRPERSON must be able to count and record the number of a set of objects such as the tools in a tool kit.

To accomplish this task, the student must be able to count a set of up to one hundred objects and state or write the number of objects counted.

To demonstrate the ability to perform this task, the student will count ninety-seven pieces of paper and write the number 97 on another piece of paper.

1B.1 Prerequisite to 3E.3 Perform addition of whole numbers given instructions such as:

What is the total of 8 and 5? 8 + 5 = ____;
8 plus 5 is ____;
Find the sum of 8 and 5;
Add 8 and 5;

$$\begin{array}{r} 8 \\ +\ 5 \\ \hline \end{array}$$

1B.2 Prerequisite to 3E.3 Find the sum of a set of whole numbers of 1 - 5 digits including cases where carrying is required.

1C.1 Prerequisite to 4B.1 Perform multiplication of whole numbers given instructions such as:

6 times 2 is ____;
Six two's are ____;
The product of 6 and 2 is ____;
6 x 2 = ____;

$$\begin{array}{r} 6 \\ \times\ 2 \\ \hline \end{array}.$$

1C.2 Prerequisite to 4B.1 Find the product of a given pair of whole numbers of which one number is up to five digits and the other number up to three digits.

2A.1a A MOTORCYCLE REPAIRPERSON must be able to read dimensions and measurements expressed in fractional terms.

To accomplish this task, the student must be able to look at a given diagram or illustration and name the fraction that represents a given number of parts out of a total number of equal parts.

To demonstrate the ability to perform this task, the student will determine the fractions represented by the shaded areas below:

3A.1 A MOTORCYCLE REPAIRPERSON must be familiar with the meanings and values of common decimals, since many of the dimensions and measurements used in motorcycle repair manuals are expressed in decimal fractions (e.g., 1.2 inches, .5 liters).

To accomplish this task, the student must be able to read a one to four place decimal fraction and write its name in words.

To demonstrate the ability to perform this task, the student will correctly read aloud the following decimal fractions and then write their names in words.

.6, 1.2, 9.6, .002, .010

3A.2 **Prerequisite to 3E.3** Write a 1 - 4 place decimal fraction given the word name of the number.

3B.1 **Prerequisite to 3E.3** Calculate the sum of a set of decimal fractions.

3C.1 **Prerequisite to 4B.1** Calculate the product of two decimal fractions when rounding off is (a) required, and (b) not required.

3C.2 **Prerequisite to 4B.1** State or write the product of a number and a power of ten between .001 and 1,000 without written calculation.

3C.5 **Prerequisite to 9A.3** State or write the quotient of a number divided by a power of ten between .001 and 1,000 without written calculation.

3E.1 **Prerequisite to 3E.3** Read a given value less than $10,000,000.00 and write its name.

3E.2 **Prerequisite to 3E.3** Write a value less than $10,000,000.00 given the word name of the amount.

3E.3 A MOTORCYCLE REPAIRPERSON must be able to make out a repair order and add amounts of money to figure total costs.

To accomplish this task, the student must be able to add columns of dollar and cent values, including amounts ranging from $.01 to $9999.99.

To demonstrate the ability to perform this task, the student will solve the following problem.

$45.00
19.73
2.45
+ 6.75

KEY: $73.93

3E.5 **Prerequisite to 6H.1** Calculate the total cost of up to twenty-five items of equal value.

4B.1 A MOTORCYCLE REPAIRPERSON must be able to calculate sales tax when determining the cost of a repair.

To accomplish this task, the student must be able to calculate a percent of a number of the following types:

5% of 170 = ____;
5.7% of 170 = ____;
5.7% of 17.43 ____.

To demonstrate the ability to perform this task, the student will calculate that:

a. 6% of $5.00 = ____
b. 6% of $6.70 = ____

KEY: a. $.30, b. $.40

6G.1 Prerequisite to 6G.2 Subtract 12-hour clock times including cases where borrowing is required.

6G.2 A MOTORCYCLE REPAIRPERSON must be able to account for time spent doing a particular job and record time on a work order.

To accomplish this task, the student must be able to measure the duration of time that has been expended to perform routine functions, correct to within 5% of the actual time.

To demonstrate the ability to perform this task, the student will measure the amount of time it takes to locate a dictionary at ACE.

6G.7 A MOTORCYCLE REPAIRPERSON must be able to give a customer an estimate of the time it will take to do a particular job.

To accomplish this task, the student must be able to estimate the duration of time required to perform routine function, to within 50% of the actual time.

To demonstrate the ability to perform this task, the student will estimate the total time it will take to write down the whole numbers from 1 to 20.

6H.1 A MOTORCYCLE REPAIRPERSON must be able to calculate repair costs on a repair order.

To accomplish this task, the student must be able to, given unit costs for material, wage or salary rates for labor, the total number of items, and the hours/days of work, calculate total costs of a job.

To demonstrate the ability to perform this task, the student will solve the following problem:

4 spark plugs at 85c/plug = ____
2.5 hours of labor at $18.50/hour = ____
6% sales tax on total cost of spark plugs = ____
Total cost = ____

KEY: $3.40, $46.25, .20, $49.85.

8A.3 Prerequisite to 9E.4 Identify a series of consecutive whole numbers or multiples of whole numbers with or without equal subdivisions between numbers on a measuring device, as a graduated scale.

8A.4 Prerequisite to 9E.4 Write the size of the interval between:

a. numerals on a graduated scale.
b. subdivisions on a graduated scale.

8A.5 Prerequisite to 9E.4 Write the measurement indicated on a sketch of a graduated scale:

a. to the nearest whole number when the scale is marked off in consecutive whole numbers with or without subdivisions.
b. to a given precision when the scale is marked off in multiples of a whole number with or without subdivisions.
c. to a given precision when the scale is marked off in whole numbers with or without subdivisions representing fractions such as halves, quarters, eights, sixteenths, tenths, or fifths.
d. to a given precision when the scale is marked off in whole numbers which represent multiples of a given number such as 100 or 1000.

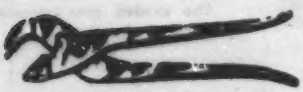
9A.1 Prerequisite to 9A.4 Identify millimeters, centimeters, decimeters, meters, decameters, hectometers and kilometers as units of metric distance measure.

9A.2 Prerequisite to 9A.4 Convert units of distance from one metric unit to another (e.g., one hectometer equals 100 meters).

9A.4 A MOTORCYCLE REPAIRPERSON must be able to use tools and parts measured in metric units (e.g., 8 mm hex nut).

To accomplish this task, the student must be able to measure a given distance or one dimension of an object with a metric ruler or tape measure, correct to within one unit of the scale reading.

To demonstrate the ability to perform this task, the student will measure the space between the jaws of the pliers below with a metric straight edge and determine its length.



9E.1 Prerequisite to 9E.4 Identify milliliter, centiliter, deciliter, liter, decaliter and hectoliter as units of metric capacity.

9E.4 A MOTORCYCLE REPAIRPERSON must be able to accurately measure liquid, such as oil, in metric units.

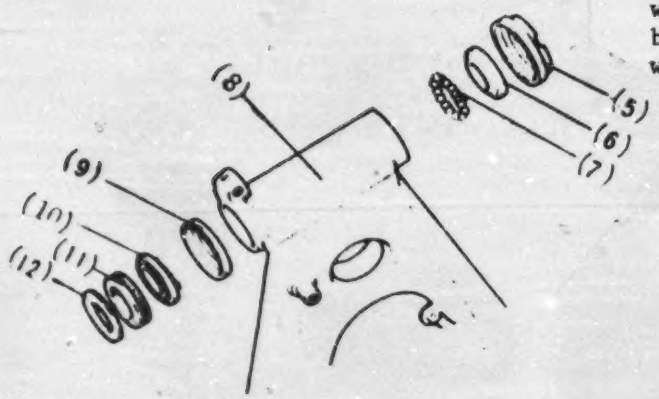
To accomplish this task, the student must be able to measure metric content or capacity of a container to within one unit of the scale of the measuring instrument.

To demonstrate the ability to perform this task, the student will measure .50 liters in a measuring cup marked with metric units.

12D.1 A MOTORCYCLE REPAIRPERSON must be able to read assembly drawings.

To accomplish this task, the student must be able to identify the order in which parts are put together in an assembly drawing.

To demonstrate the ability to perform this task, the student will examine the assembly drawing below and determine the order in which the parts are to be assembled.

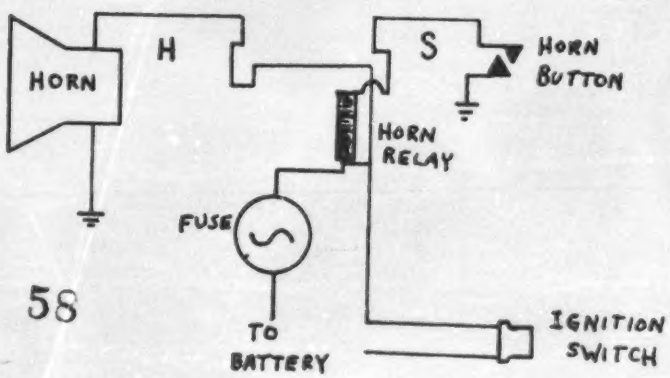


Assembly Drawing

12E.1 A MOTORCYCLE REPAIRPERSON must be able to read schematic drawings when making repairs on the electrical system of a motorcycle.

To accomplish this task, the student must be able to trace a particular subsystem on a simple schematic drawing.

To demonstrate the ability to perform this task, the student will trace subsystem S on the drawing below.



13A.1 Prerequisite to 15A.3 Given letters of the alphabet in manuscript form and in random order, read each letter and pronounce each letter correctly.

15A.1 Prerequisite to 15A.3 Read a list of 50 words from a series of commonly used terms (eg from the Dolch List).

15A.2 Prerequisite to 15A.3 Read words from the labels of frequently-used products or of products used in a given occupation.

15A.3 A MOTORCYCLE REPAIRPERSON must be able to converse with customers and coworkers.

To accomplish this task, the student must be able to read and use in an oral sentence words from a list of words common to the vocabulary of the occupation.

To demonstrate the ability to perform this task, the student will match the following with 90% accuracy.

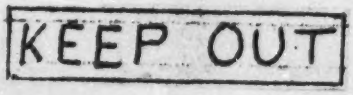
A. cylinder	1. any of a number of tools used for holding and turning nuts, bolts, and pipes
B. transmission	2. a connected group of cells storing an electrical charge and capable of furnishing a current
C. crankcase	3. any of various devices for starting an internal combustion engine
D. generator	4. a written order to put something back in good condition
E. wrench	5. any of various machines that force oil into or through, or draw it out of something
F. repair order	6. metal casing of the crankshaft
G. starter	7. chamber in which the piston moves in a reciprocating engine
H. battery	8. a mechanical device, as in an automobile, for engaging or disengaging the motor or the lever or pedal that operates the motor
I. oil pump	9. a device in which air is mixed with gasoline spray to make an explosive mixture in an internal-combustion engine
J. carburetor	10. a machine for changing mechanical energy into electrical energy

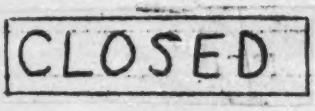
KEY: A-7; B-8; C-6; D-10; E-1; F-4; G-3; H-2; I-5; J-9.

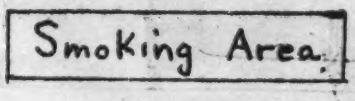
15B.1 A MOTORCYCLE REPAIRPERSON must be able to understand work conditions in order to work safely.

To accomplish this task, the student must be able to read aloud and explain a series of common functional signs (e.g., safety signs, road signs etc.).

To demonstrate the ability to perform this task, the student will read aloud the following signs and briefly explain their meanings to the instructor:







16A.1 Prerequisite to 16A.4 Identify a form as a standardized printed document with blank spaces for recording certain needed information.

16A.2 Prerequisite to 16A.4 Interpret terminology and abbreviations frequently found in forms.

16A.3 Prerequisite to 16A.4 Identify various kinds of forms by stating the kind of information to be recorded.

16A.4 A MOTORCYCLE REPAIRPERSON must be able to read a repair order in order to know what repairs are required

To accomplish this task, the student must be able to, given a variety of completed common business forms such as work orders, job orders, issue and receipt vouchers, claims, and purchase orders, answer factual questions based on the data on the forms.

To demonstrate the ability to perform this task, the student will determine from 24-B the following information:

a. the order number;
b. the engine number of the bike repaired.

16A.4 A MOTORCYCLE REPAIRPERSON must be able to read a paycheck and other business forms.

To accomplish this task, the student must be able to, given a variety of common business forms such as work orders, pay vouchers and receipts, answer factual questions based on the data in the form.

To demonstrate the ability to perform this task, the student will refer to the paycheck below and determine from the check stub that the gross pay is $190.40, the withholding is $25.50, the Social Security tax is $8.00 and the net pay is $156.90.

Name Louis Stacey			
From 8/19 To 9/1 Incl.			
Regular		190.	40
Overtime			
Total Earnings		190.	40
wh/tax	25. 50		
F.I.C.A.	8. 00		
Total Deductions		33.	50
Amount of Check		156.	90

No. 153

September 8, 19 67

Pay to the order of Louis Stacey $ 156.90

One hundred fifty-six and 90/100 Dollars

Valley National Bank

Tristram Shandy

16B.1 Prerequisite to 16B.3 Describe the uses of charts and tables and define them as a visual way to give information in a compact and organized form.

16B.2 Prerequisite to 16B.3 State the type of information recorded on given charts or tables.

16B.3 A MOTORCYCLE REPAIRPERSON must be able to read and use information provided in maintenance schedules to know when to service a bike.

To accomplish this task, the student must be able to, given common reference tables and charts such as organization charts, parts charts and reference tables--including charts and tables designed in matrix form (rows and columns)--answer factual questions based on the data contained in them.

To demonstrate the ability to perform this task, the student will determine from 24-C that the oil pump operation must be checked approximately every 6 months or 3000 miles.

16D.1 Prerequisite to 16D.3 Identify a manual as a handbook of instructions and/or information related to one topic, and give an example of a manual.

16D.3 A MOTORCYCLE REPAIRPERSON must be able to use a shop manual to find out how to do a particular task.

To accomplish this task, the student must be able to identify the parts of a given manual that apply to a given situation, using the table of contents and/or index as a guide.

To demonstrate the ability to perform this task, the student will determine from the table of contents, 24-D, that information on servicing the carburetor is located on page 52.

19A.15 A MOTORCYCLE REPAIRPERSON must be able to recall oral instructions given by the shop manager

To accomplish this task, the student must be able to perform a series of two or three activities that require recall of oral instructions. (The activities are to be within the abilities of the student--recall is the item to be demonstrated.)

To demonstrate the ability to perform this task, the student will recall the following three instructions given by the instructor after thirty minutes:

a. have the cycle repair job for Mr. Wilson completed today;
b. order parts for next week;
c. do spot check inventory.

21A.1 Prerequisite to 21A.3 Identify seconds, hours, days, months, years, decades, centuries as units of time.

21A.2 Prerequisite to 21A.3 Given dates of the year, locate dates on a current calendar.

21A.3 A MOTORCYCLE REPAIRPERSON must be able to write dates on work orders.

To accomplish this task, the student must be able to, given a day (day, month, year) orally, write the date, using correct punctuation and capitalization.

To demonstrate the ability to perform this task, the student will write and correctly capitalize and punctuate five dates similar to:

Thursday, March 20, 1976.

21A.4 Prerequisite to 21A.5 Given a standard clock, tell correct time to within 5 minutes of actual time.

21A.5 A MOTORCYCLE REPAIRPERSON must be able to write time on work orders, notes, etc.

To accomplish this task, the student must be able to, given times of the day, be able to write time in the following ways:

a. 8:00
b. eight o´clock
c. 8 o´clock

To demonstrate the ability to perform this task, the student will examine the clocks below and accurately record the indicated time.

21A.8 A MOTORCYCLE REPAIRPERSON must be able to write addresses on work orders.

To accomplish this task, the student must be able to, given a list of names and addresses, write items using proper capitalization and punctuation.

To demonstrate the ability to perform this task, the student will correctly write an address, taken at random, from the telephone directory and dictated by the instructor.

22A.1 Prerequisite to 22B.2 Given simple data in the form of words and figures, write phrases on forms which are legible and which convey the desired information.

22B.1 Prerequisite to 22B.2 Given simple data in the form of words and figures, write complete sentences on forms which are legible and which convey the required information.

22B.2 A MOTORCYCLE REPAIRPERSON must be able to complete an application for employment when applying for a job.

To accomplish this task, the student must be able to complete in a legible manner a sample application for employment.

To demonstrate the ability to perform this task, the student will accurately and legibly complete all sections of 24-E.

22B.7 A MOTORCYCLE REPAIRPERSON must be able to fill out a W-4 form when accepting employment.

To accomplish this task, the student must be able to complete state and federal government forms that are in current use for income tax, medical and hospital services. census. Social Security, etc.

To demonstrate the ability to perform this task, the student will accurately and legibly complete the W-4 form below.

Form **W-4**
(Rev. Sept. 1974)
Department of the Treasury
Internal Revenue Service

Employee's Withholding Allowance Certificate

(This certificate is for income tax withholding purposes only; it will remain in effect until you change it.)

Type or print your full name

Your social security number

Home address (Number and street or rural route)

Marital status
☐ Single ☐ Married
(If married but legally separated, or spouse is a nonresident alien, check the single block.)

City or town, State and ZIP code

1 Total number of allowances you are claiming . . . . . .

2 Additional amount, if any, you want deducted from each pay (if your employer agrees) . . . . . $

I certify that to the best of my knowledge and belief, the number of withholding allowances claimed on this certificate does not exceed the number to which I am entitled.

Signature ▶ ..... Date ▶ ....., 19.....

22B.1 A MOTORCYCLE REPAIRPERSON must be able to write short notes regarding work to be done or parts to be ordered.

To accomplish this task, the student must be able to write down the exact words of a short message given orally .

To demonstrate the ability to perform this task, the student will write a note, given the following information orally by the instructor:

To: Supervisor
From: Employee
This work was completed yesterday, May 15:

a. ordered part #3514
b. checked oil on bike #35064
c. set up new bikes.

25A.1 Prerequisite to 25A.6 Repeat information which has been heard.

25A.3 Prerequisite to 25A.6 Answer questions orally about material read (such as a note, memo or letter).

25A.6 A MOTORCYCLE REPAIRPERSON must be able to explain to a customer what repairs have to be made.

To accomplish this task, the student must be able to explain to someone else how to perform a fairly complex task, given experience at performing the task, or having learned from another person or a manual how to perform the task.

N.B.: These objectives are intended to develop skills of imparting information and instructions. The exercises and tests should be carefully designed to ensure that the ability to express information or directions which are understandable to the listener, rather than memory, is being tested.

To demonstrate the ability to perform this task, the student will tape record step-by-step directions on how to tie shoe laces. When the tape is played back, the student must be able to tie shoes correctly according to the directions on the tape.

25C.1 A MOTORCYCLE REPAIRPERSON must be able to call customers on the telephone.

To accomplish this task, the student must be able to locate and write the telephone number of a given person or organization, using the alphabetical listing section of a telephone directory as reference.

To demonstrate the ability to perform this task, the student will locate the names and telephone numbers of five persons in the telephone directory, given the names orally by the instructor.

26B.1 A MOTORCYCLE REPAIRPERSON must be able to sort and organize tools efficiently.

To accomplish this task, the student must be able to, given objects, sort them by given classification criteria. The sorting should reguire a minimum of judgment. (To oversimplify, sorting apples by type or tools by various generic classifications would be appropriate, but sorting apples by quality,or lumber by grades is a rating skill.)

To demonstrate the ability to perform this task, the student will sort a group of books by color.

24-A

Substitute Assembly Drawing of Cylinder Head

578

24-B

MOTORCYCLE REPAIR

Central Ave.
Our Town, USA

Repair Order No. 5082

Warranty Reg. No.

Model CL 350

Frame No. 3001267

Engine No. 3012678

Owner's Name

Phone No.

Address

Dealer Purchased From | Lic. No. | Year | Make HN

Mileage at Failure 2000

Date of Purchase Mo. Day Yr.

Date of Failure Mo. 8 Day 20 Yr. 73

Date Repair Completed Mo. Day Yr.

Authorization Report No.

REPAIR ORDER INSTRUCTIONS

Install new wiring harness 1.8 Hr @ 8.50 24.05

ADDITIONAL PARTS

QTY.	CODE	DESCRIPTION OF PARTS	AMOUNT
1		Wire harness	
3		bulbs	
2		Tail lenses	
1		RH switch	

TOTAL LABOR

DATE IN SHOP | MECH.

DUE | CALL

INSPEC.

2ND ESTIMATE | PHONED | VERBAL

THANK YOU FOR THIS OPPORTUNITY TO SERVE YOU.

(CONTINUED ON BACK)

I hereby authorize the above repair work to be done along with the necessary materials. You and your employees may operate above vehicle for purposes of testing, inspection or delivery at my risk. An express mechanic's lien is acknowledged on above vehicle to secure the amount of repairs thereto. Conditions: not responsible for loss or damage to vehicle or articles left in vehicles in case of fire, theft, accident or any other cause beyond our control. Storage will be charged commencing 48 hours after repairs are completed.

ESTIMATED LABOR | ESTIMATED PARTS

CUSTOMER SIGNATURE

INTERNAL SUMMARY

Acct.	Charge	Cost

TOTAL LABOR	
TOTAL PARTS	
GAS, OIL, GREASE	
SUB-TOTAL (Taxable Items)	
SALES TAX	
TOTAL AMOUNT	

24-C

Substitute Graphic Maintenance Schedule from Owner's Manual

24-E

EMPLOYMENT APPLICATION

1. NAME (Last) (First) (Middle)

2. ADDRESS (Number, Street, City, Zip Code) | 3. TELEPHONES Home _____ Business _____

Length of Time at Current Address | Time at Previous Address

QUESTIONS 4 THROUGH 10 MUST BE ANSWERED *YES* OR *NO*

	YES	NO
4. Do you have a valid California Drivers License?		
5. Do you claim Veteran's Preference? If *Yes*, complete the following and submit copy of DD214 with application. (Veteran's Preference is applicable to entry level positions, only.) SERVICE DATES From _____ To _____ NOTE: To receive credit you must have served at least 30 days in the United States Armed Forces in time of war, or national emergency declared by the President of the United States of America, and have been discharged or released under conditions other than dishonorable.		
6. May we contact your present employer as to your qualifications, character and ability?		
7. Have you ever been dismissed from employment or resigned to avoid dismissal for misconduct or unsatisfactory service? (If *Yes*, give details in Question 11)		
8. Have you ever received Workman's Compensation? (If *Yes*, describe in Question 11)		
9. Have you any disease, nervous disorder, physical disability or infirmity? (If *Yes*, describe in Question 11)		
10. Have you been hospitalized for any reason in the past five years? (If *Yes*, describe in Question 11)		

11 Explanations to questions 7 through 10 (Use additional sheets of paper, if necessary.)

12 EDUCATIONAL RECORD

Circle Highest Grade Completed: 6 7 8 9 10 11 12 | Name and Location of Last Elementary or High School | Graduated? Yes ☐ No ☐

Name and Location of College or University | Major | Credits or Degree

List any related business, trade, special training (give location and dates); estimated typing and shorthand speeds; San Mateo County typing and/or shorthand certificates (give certificate number and date); location of college placement file; and other related information as applicable.

13. EMPLOYMENT INFORMATION

(Begin with your present employment and work back. Account for all time during the past ten years, including periods of unemployment. In addition, please describe any other related work experience, including volunteer work. Use additional sheets if more space is required.)

Present or Last Position

Employer _____ From _____ mo. year

Address _____ To _____ mo. year

Supervisor's Name & Title _____ Phone _____ Total _____ years months

Your Title _____ Full Time ☐ Part Time ☐

Duties _____ Last Salary _____

_____ Reason for leaving _____

Employer _____ From _____ mo. year

Address _____ To _____ mo. year

Supervisor's Name & Title _____ Phone _____ Total _____ years months

Your Title _____ Full Time ☐ Part Time ☐

Duties _____ Last Salary _____

14. PERSONAL REFERENCES - GIVE THREE (Do not include previous employers or relatives.)

NAME	ADDRESS	PHONE NUMBER